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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/944,038	08/30/2001	Jorg Bredthauer	Mo-6555 STA-171	5584

157 7590 09/30/2002

BAYER CORPORATION  
PATENT DEPARTMENT  
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EXAMINER

WESSMAN, ANDREW E

ART UNIT	PAPER NUMBER
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1742

DATE MAILED: 09/30/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/944,038

Applicant(s)

BREDTHAUER ET AL.

Examiner

Andrew E Wessman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5,7,8.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

1. Claims 1-14 have been submitted for examination.

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 2, 6, 7, and 9, 10, and 12-14 rejected under 35 U.S.C. 102(b) as being anticipated by Kronenwetter et al. (U.S. Patent No. 4,402,737).

Kronenwetter et al. anticipates the invention. Kronenwetter et al. discloses (see abstract) a process for producing tungsten metal powder or tungsten carbide powder by a process wherein alkali metal compound (a lithium compound) is added to a tungsten oxide starting powder, and then the mixture is reduced using hydrogen gas.

Kronenwetter et al. also discloses (col. 2, lines 30-35, and tables I, III, and V) that sodium and potassium may be present in addition to lithium. Kronenwetter et al. discloses (tables I, III, and V) that  $WO_3$  may be the starting powder, and also mentions throughout the disclosure that tungsten oxide in general is the starting material. While not specifically recited in the reference, the reaction between the alkali metal compounds and the tungsten oxide would inherently produce intermediate compounds of the  $(Li, Na, K)WO_z$  type, wherein  $z$  ranges from 3 to 4, because the same starting materials are being used in the same operation, and therefore the same chemical

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reactions are taking place. Such compounds would also inherently possess a melting point of less than 550°C, as this is an intrinsic property of the chemical compound.

In regards to the features of claim 2, Kronenwetter et al. discloses (col. 3, lines 7-39) that the tungsten powder may be carburized to form tungsten carbide powder, and describes a method for doing so.

In regards to the features of claim 6, Kronenwetter et al. discloses (col. 2, lines 36-44) that the alkali metal compound used can be selected from halides and carbonates.

In regards to the features of claim 7, Kronenwetter et al. discloses (see tables I, III, and V) that the oxide used may be  $WO_3$ .

In regards to the features of claim 9, Kronenwetter et al. discloses (col. 1, line 61) that hydrogen gas may be used in the reduction step.

In regards to the features of claims 10 and 12, Kronenwetter et al. discloses (col. 1, lines 5-9) that the process is used to create tungsten and tungsten carbide powders.

In regards to the features of claim 13, Kronenwetter et al. discloses (tables III and V) that 500ppm lithium-doped-process tungsten powders have FSSS particle sizes of over 50 microns.

In regards to the features of claim 14, Kronenwetter et al. discloses (col. 1, lines 10-19) using the tungsten carbide to make sintered hardmetal objects and infiltrated tools.

***Claim Rejections - 35 USC § 103***

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4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 3-5, 8, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kronenwetter et al.

In regards to the features of claim 3, Kronenwetter et al. teaches (col. 2, line 68-co. 3, line 4) that the amount of dopant present is less than 2000ppm by weight, and this is equivalent to an amount of approximately 0.66 mol% lithium carbonate. While many variables can affect the number, such as the amount of sodium or potassium compounds, the type of alkali metal compounds used (see col. 2, lines 36-53), and the amount of dopant used, it is apparent that these variables will effectively create a range of dopant concentrations covering a substantial portion of applicant's claimed range. Regardless, the 0.66wt% of lithium compound given is squarely within applicant's claimed range, and the variations that can be present in the teachings of Kronenwetter et al. also disclose values that are within applicant's claimed range, and it would have been obvious to one of ordinary skill in the art to use an alkali metal compound in the amounts taught by Kronenwetter et al. which would be expected to fall within applicant's claimed compositional range.

With regards to the features of claims 4 and 5, Kronenwetter et al. does not specifically teach the use of a molar ratio of Na to Li of from 0.9 to 1.26, nor does Kronenwetter et al. teach using the powders as a mixed salt. Kronenwetter et al. also

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does not specifically teach using  $WO_2$  as the oxide starting material. However, Kronenwetter et al. teaches (see tables I, III, and V specifically, and col. 2, lines 62-68) that sodium and potassium are also useful in the process of making tungsten metal powders, and that sodium and potassium have a less severe effect on producing large grain sizes than lithium. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a mixture of alkali metal salts, such as lithium, potassium and sodium, to practice the invention and obtain a tungsten metal powder with the desired particle size by adjusting the ratio of the various alkali metal powders used. Such a mixture of alkali metal compounds, such as carbonates, amounts to a mixed salt of alkali carbonates. Such a mixed salt could be adjusted for various ratios to obtain the desired grain size, and the ratios of applicant's claimed invention could be found by routine experimentation owing to the fact that the amounts of lithium, sodium, and potassium used as dopant are a result effective variable for grain size, as shown by Kronenwetter et al. (tables I, III, and V). Where the effect of such a variable is known, it is not inventive to discover optimum or workable ranges. See MPEP 2144.05.

With regards to the features of claim 8, wherein the oxide powder is  $WO_2$ , while Kronenwetter et al. does not specifically mention using such a starting material, Kronenwetter et al. mentions that multiple oxide types may be used in the practice of the process (col. 2, line 26), such as yellow or blue oxide. It is assumed that one oxide is  $WO_3$  and one oxide is  $WO_2$ , and one of ordinary skill in the art would find it obvious to

practice the process of Kronenwetter et al. using  $WO_2$  with expected success because of the teaching that it is applicable to multiple oxide types.

In regards to the features of claim 11, Kronenwetter et al. does not teach specifically that molybdenum metal powder may be produced by the process. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to practice the invention of Kronenwetter et al. using molybdenum with expected success when it is desired to form molybdenum powder because of the chemical similarities between molybdenum and tungsten and their interchangeability in such processes.

### ***Conclusion***

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Gomes et al. (U.S. Patent No. Re. 32,612) a process for forming tungsten monocarbide using gas reduction and alkali halides.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew E Wessman whose telephone number is (703)305-3163. The examiner can normally be reached on Monday through Friday, 8:00am to 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (703)308-1146. The fax phone numbers for the organization where this application or proceeding is assigned are (703)872-9310 for regular communications and (703)872-9311 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0661.

AEW  
September 26, 2002

ROY KING *R-K*  
SUPERVISORY PATENT EXAMINER  
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